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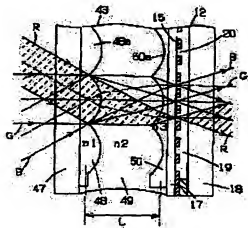
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 AOYAMA SHIGERU
 KAISE KIKUO

(54) IMAGE PROJECTOR

(57)Abstract:

PROBLEM TO BE SOLVED: To streamline light paths so that image forming lenses used in an image projector can be simplified.

SOLUTION: A microlens array element 43 with microlens arrays 48, 50 is disposed on the light incident side of a liquid crystal display panel 12. Red, green and blue light falling on the microlens array element 43 at different angles to optical axes are converged on adjacent pixels 20 of the liquid crystal panel 12 by the microlens arrays 48, 50. The optical axes of the red, green and blue light are bent by the microlens array 50 so that the optical axes are made parallel to each other after passing through the liquid crystal display panel 12.



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**Japanes Publication f r Unexamin d
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No. 2000-147500 (Tokukai 2000-147500)**

A. Relevance of the Above-identified Document

This document has relevance to all claims of the present application.

B. Translation of the Relevant Passages of the Document

[0025]

(A method for manufacturing a micro-lens array element)

As shown in Figures 11(a) through 11(h), the micro-lens array element 43 is integrally formed with a glass substrate 17 of the liquid crystal display panel 12. First of all, an ultraviolet-hardening resin 52 is supplied on a stamper 51 formed with a reversal pattern of a micro-lens array 50 [Figure 11(a)]. Next, the ultraviolet-hardening resin 52 is pressed by the glass substrate 17 to spread between the stamper 51 and the glass substrate 17. Thereafter, the ultraviolet-hardening resin 52 is hardened by ultraviolet irradiation through the glass substrate 17 [Figure 11(b)], thereby forming the micro-lens array 50. The micro-lens array 32 after hardened is separated from the stamper 51 [Figure 11(c)].

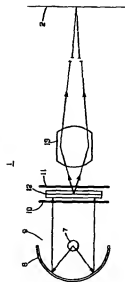
Similarly, an ultraviolet-hardening resin 54 is supplied on a stamper 53 formed with a reversal pattern of a micro-lens array 48 [Figure 11(d)]. Next, the ultraviolet-hardening resin 54 is pressed by a glass substrate 47 to spread between the stamper 53 and the glass substrate 47. Thereafter, the ultraviolet-hardening resin 54 is hardened by ultraviolet irradiation through the glass substrate 47 [Figure 11(e)], thereby forming the micro-lens array 48. The micro-lens array 48 after hardened is separated from the stamper 53 [Figure 11(f)]. Subsequently, an ultraviolet-hardening resin 55 is supplied on the micro-lens array 48 that has been formed on the glass substrate 47 [Figure 11(g)]. The ultraviolet-hardening resin 55 is pressed by the glass substrate 17 with the micro-lens array 50 faced down, and a distance between the micro-lens arrays 48 and 50 is adjusted. Thereafter, the ultraviolet-hardening resin 55 is hardened by ultraviolet irradiation, thereby forming a transparent resin layer 49 [Figure 11(h)]. This manufactures the micro-lens array element 43 integrally.

[Figure 11]

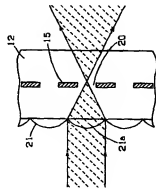
A view showing a method for manufacturing the above micro-lens array element.

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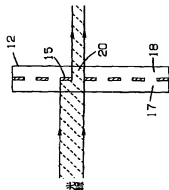
【図3】



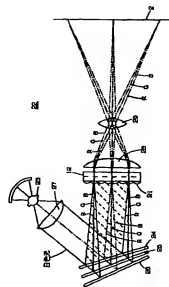
【図6】



【図5】

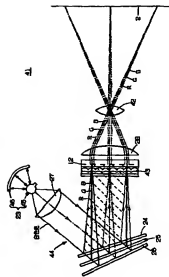


【図7】

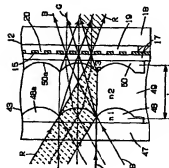


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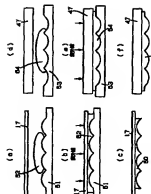
【図9】



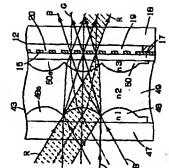
【図10】



【図11】

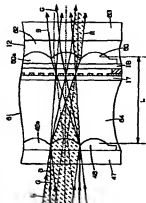


【図12】

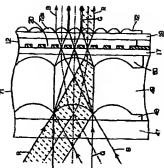


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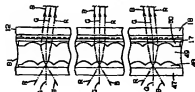
【図1.3】



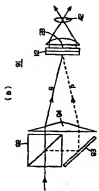
【図1.4】



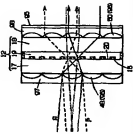
【図1.5】



【図1.6】



(b)



フロントページの続き

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